Amendments to the Claims

Claims 1-28 (Canceled)

29. (Currently amended): A syringe assembly having a retractable needle and designed for one-time use, comprising:

a hollow syringe body comprising a substantially cylindrical barrel having a front end portion and a back end portion, the front end portion containing a retraction mechanism having a retractable needle, a needle holder having an inner head and a continuous retainer member configured for operation by forward movement of a plunger, and the back end portion ~~having~~ comprising at least one radially extending ~~finger grip~~ member providing finger grips for the syringe body, and a collar comprising an open back end, the collar extending rearwardly behind the at least one ~~finger grip~~ radially extending member[[,]] and longitudinally separating the at least one radially extending member from the ~~collar having an~~ open back end;

the continuous retainer member surrounding the inner head of the needle holder and having a surface mating with a facing surface of the hollow syringe body, thereby making a seal for a variable fluid chamber in the barrel;

a plunger having a front end portion comprising a head, an outer wall surface on the plunger front end portion having a plunger seal element fixed on the outer wall surface, and a back end portion with an end cap having an outer periphery;

the plunger being reciprocally mounted in said barrel with the plunger seal element in sliding sealed contact with the barrel; and

the retraction mechanism being released for retraction of the retractable needle when the plunger is fully depressed to release the continuous retainer member, without moving the plunger seal element longitudinally along the outer wall surface;

the outer periphery of the plunger end cap being disposed in close proximity to the back end of the collar upon retraction.

30. (Previously presented): The assembly of claim 29 wherein a structure disposed in the front end portion of the barrel prevents forward motion of the retractable

needle relative to the body as the plunger is fully depressed to prevent pain to a patient during retraction.

31. (Previously presented): The assembly of claim 29 wherein the plunger carries a tip which protrudes to contact the continuous retainer member and release the retractable needle when retraction is initiated by pushing on the plunger.

32. (Previously presented): The assembly of claim 29 wherein the continuous retainer member is a separable part of the retraction mechanism which acts as a fluid seal for a variable chamber in the barrel behind the separable part.

33. (Previously presented): The assembly of claim 31 wherein the continuous retainer member is separable from the inner head of the needle holder when retraction is initiated by pushing on the plunger.

34. (Previously presented): The assembly of claim 33 wherein the continuous retainer member is separated from the inner head of the needle holder by means of force applied by said tip to said continuous retainer member when retraction is initiated by pushing on said plunger.

35. (Canceled)

36. (Previously presented): The assembly of claim 29 wherein the outer periphery of the plunger end cap is lodged in close confinement with the back end of the collar by pressing the end cap to cause retraction, whereby the plunger is not easily graspable after retraction.

37. (Currently amended): A syringe assembly having a retractable needle and designed for one-time use, comprising:

a hollow syringe body comprising a substantially cylindrical barrel having a front end portion and a back end portion, the front end portion containing a retraction

mechanism, the retraction mechanism having a retractable needle and a continuous retainer member which retains the retractable needle prior to retraction, and a back end portion ~~having~~ comprising at least one radially extending ~~finger grip~~ member providing finger grips for the syringe body, and a collar comprising an open back end, the collar extending rearwardly behind the at least one ~~finger grip~~ radially extending member[[,]] and longitudinally separating the at least one radially extending member from the ~~collar having an~~ open back end;

a plunger having a front end portion comprising a head and an outer wall surface located on the front end portion, with a plunger seal element fixed on the outer wall surface, and a back end portion with an end cap having an outer periphery, the retraction mechanism being operable by forward movement of the plunger without distorting the barrel;

the plunger being reciprocally mounted in said barrel with the plunger seal element in sliding sealed contact with the barrel; whereby

forward movement of the plunger releases the retractable needle from the continuous retainer member by applying a separating force to the continuous retainer member without the aid of the plunger seal element and without moving the plunger seal element longitudinally along the outer wall surface;

the outer periphery of the plunger end cap being disposed in close proximity to the back end of the collar upon retraction.

38. (Previously presented): The assembly of claim 37 wherein the continuous retainer member acts as a fluid seal for a variable chamber in the barrel behind the continuous retainer member.

39. (Previously presented): The assembly of claim 38 wherein a structure disposed in the front end portion of the barrel prevents forward motion of the retractable needle relative to the body as the plunger is fully depressed to prevent pain to a patient during retraction.

40. (Previously presented): The assembly of claim 37 wherein the continuous retainer member releases the retractable needle when retraction is initiated by pushing the plunger to move it forward with respect to the barrel.

41. (Previously presented): The assembly of claim 40 wherein the plunger carries a tip which protrudes to contact the continuous retainer member and release the retractable needle when retraction is initiated by pushing on the plunger.

42. (Previously presented): The assembly of claim 41 wherein the continuous retainer member releases the retractable needle by means of force applied by said tip to said continuous retainer member when retraction is initiated by pushing on said plunger.

43. (Canceled)

44. (Previously presented): The assembly of claim 37 wherein the outer periphery of the plunger end cap is lodged in close confinement with the back end of the collar by pressing the end cap to cause retraction.

45. (Currently amended): A syringe assembly designed for one-time use, comprising:

a hollow syringe body comprising a substantially cylindrical barrel having a front end portion and a back end portion, the front end portion containing a retraction mechanism, the retraction mechanism having a retractable needle, a continuous retainer member that retains the retractable needle prior to retraction, and a back end portion ~~having~~ comprising at least one radially extending ~~finger grip~~ member providing finger grips for the syringe body, and a collar comprising an open back end, the collar extending rearwardly behind the at least one ~~finger grip~~ radially extending member[[,]] and longitudinally separating the at least one radially extending member from the ~~collar having an~~ open back end;

the continuous retainer member having a surface mating with a facing surface of the hollow syringe body, thereby making a seal for a variable fluid chamber in the barrel;

a plunger having a front end portion comprising a head and an outer wall surface located on the front end portion, a plunger seal element fixed on the outer wall surface, and a back end portion with an end cap having an outer periphery;

the plunger being reciprocally mounted in said barrel with the plunger seal element in sliding sealed contact with the barrel; and

the retraction mechanism being released for retraction when the plunger is moved forward to release the continuous retainer member, without the plunger seal element going beyond said outside surface of the continuous retainer member and without moving the plunger seal element longitudinally along the outer wall surface;

the outer periphery of the plunger end cap being disposed in close proximity to the back end of the collar upon retraction.

46. (Previously presented): The assembly of claim 45 wherein the continuous retainer member acts as a fluid seal for a variable chamber in the barrel behind the continuous retaining member.

47. (Previously presented): The assembly of claim 46 wherein a structure disposed in the front end portion of the barrel prevents forward motion of the retractable needle relative to the body as the plunger is fully depressed to prevent pain to a patient during retraction.

48. (Previously presented): The assembly of claim 45 wherein the continuous retainer member is separable from the retractable needle when retraction is initiated by pushing the plunger to move it forward with respect to the barrel.

49. (Previously presented): The assembly of claim 48 wherein the plunger carries a tip which protrudes to contact the continuous retainer member and release the retractable needle when retraction is initiated by pushing on the plunger.

50. (Previously presented): The assembly of claim 49 wherein the continuous retainer member is separated from the retractable needle by means of force applied by

said tip to said continuous retainer member when retraction is initiated by pushing on said plunger.

51. (Canceled)

52. (Currently amended): The assembly of claim 45 wherein the outer periphery of the plunger end cap is lodged in close confinement with the back end of the collar by pressing the plunger end cap to cause retraction[[,]].

53. (Canceled)

54. (Currently amended): A syringe assembly having a retractable needle and designed for one-time use, comprising:

a body;

a front end retraction mechanism having a needle holder with a needle holding portion in front and a head in back, a retractable needle attached to the needle holder and partially disposed inside a part of the needle holding portion of the needle holder that is inside the body, a biasing element exerting force on the needle holder; and a continuous retainer member, the retraction mechanism being grounded by a barrier limiting forward motion prior to a release of the needle holding portion during retraction; and

a plunger slidably engaging the body and having a front end portion comprising a head and an outer wall surface on the front end portion having a plunger seal element fixed on the outer wall surface;

wherein the needle holding portion of the needle holder extends forwardly beyond the biasing element;

wherein the retraction mechanism is operated by forward movement of the plunger to release the retractable needle for retraction while the plunger seal element remains fixed to the outer wall surface; and

wherein the body has a rigid stop surface that stops forward movement of the plunger following release of the retractable needle.

55. (Previously presented): The syringe assembly of claim 54 wherein the plunger operates the retraction mechanism by acting on the continuous retainer member to release the retractable needle for retraction while the plunger seal element remains fixed to the outer wall surface.

56. (Canceled)

57. (Canceled)

58. (Currently amended): A syringe comprising a hollow body with first and second open ends and an inside wall of varying inside diameter extending between the first and second open ends, a needle retraction mechanism insertable into the body through the second open end, a plunger having a forwardly extending plunger head insertable into the body through the second open end behind the needle retraction mechanism, and a needle extending forwardly of the first open end, wherein:

the body comprises a nose adjacent to the first open end, a barrel adjacent to the second open end, and a transition zone connecting the barrel and nose;

the needle retraction mechanism comprises an elongated needle holder, a compressed retraction spring, and a retainer member;

the elongated needle holder further comprises a needle holding portion secured in fixed relation to the needle, a reduced diameter portion at one end of the needle holding portion, the reduced diameter portion extending forwardly through the first open end; a head at another end of the needle holding portion opposite the reduced diameter portion; a fluid path extending longitudinally through the needle holder in fluid communication with the needle and with a variable fluid chamber inside the body between the needle holder and the plunger;

the needle holding portion is grounded inside the nose adjacent to the first open end by a barrier limiting forward motion of the elongated needle holder inside a front portion of the nose prior to a release of the needle holding portion during retraction;

the compressed retraction spring is positioned prior to retraction in an annulus

disposed between the needle holding portion and the inside wall of the hollow body;

the plunger head is aligned to separate the retainer member from the head of the needle holding portion and release the compressed retraction spring during retraction; and

the plunger comprises a retraction cavity into which part of the retraction mechanism is received during retraction so that the needle no longer extends forwardly of the first open end.

59. (Previously presented): The syringe of claim 58 wherein the inside diameter of the barrel is larger than the inside diameter of the nose, and the inside diameter of the transition zone tapers inwardly between the barrel and the nose.

60. (Previously presented): The syringe of claim 58 wherein the inside wall of the body further comprises an annular shoulder proximal to the first open end that is a barrier limiting forward motion of the elongated needle holder inside a front portion of the nose.

61. (Previously presented): The syringe of claim 58 wherein the plunger head further comprises a tip forming an opening into the retraction cavity.

62. (Previously presented): The syringe of claim 61 wherein a resilient dislodgeable stopper is positioned in the opening into the retraction cavity.

63. (Previously presented): The syringe of claim 62 wherein a front portion of the dislodgeable stopper extends forwardly of the tip.

64. (Previously presented): The syringe of claim 58 wherein the plunger head further comprises seal slidably engaging the inside wall of the barrel.

65. (Previously presented): The syringe of claim 64 wherein the seal is mounted in a fixed axial position on the plunger.

66. (Previously presented): The syringe of claim 58 wherein the plunger further comprises a rear end portion opposite the plunger head, and a thumb cap at the rear end portion.

67. (Previously presented): The syringe of claim 66 wherein the thumb cap has an opening.

68. (Previously presented): The syringe of claim 67 wherein a closure is installed in the opening and the retraction cavity is vented.

69. (Previously presented): The syringe of claim 66 wherein the barrel comprises a collar adjacent to the second open end, and the thumb cap fits in close proximity to the collar when the plunger is depressed during retraction.

70. (Previously presented): The syringe of claim 69 wherein the plunger end cap is lodged in the barrel collar by pressing the plunger to cause retraction.

71. (Previously presented): The syringe of claim 58 comprising a one-piece barrel.

72. (Previously presented): The syringe of claim 58 wherein the retainer member is positioned at the most constricted portion of the transition zone prior to retraction.

73. (Currently amended): The syringe of claim 58 wherein the retainer member is coupled to the needle holder head with a holding force which exceeds a retraction force applied to the needle holder head by the compressed retraction spring.

74. (Currently amended): The syringe of claim 58 wherein the nose comprises an annular space between the inside wall and the retraction spring into which the

retainer member is forced by the plunger head during retraction.

75. (Previously presented): The syringe of claim 58 wherein the needle is inserted into the reduced diameter portion of the elongated needle holder extending forwardly of the body and is attached to the elongated needle holder.

76. (Currently amended): The syringe of claim 58 wherein the inside wall of the body forwardly of the transition zone cooperates with the needle holder as a spring guide during compression of the retraction spring.

77. (Previously presented): The syringe of claim 58 wherein the retainer member has an outside mating surface making a seal with the inside wall.

78. (Canceled)

79. (Previously presented): The retraction mechanism of claim 61 wherein the retraction mechanism is releasable by forward movement of the plunger to disengage the retainer member from the needle holder head without contact between the plunger seal element and the retainer member.

80. (Previously presented): The syringe of claim 58 wherein the retainer member acts as a fluid seal for the variable fluid chamber prior to retraction.

81. (Currently amended): A syringe comprising a hollow body with first and second open ends and an inside wall of varying inside diameter extending between the first and second open ends, a needle retraction mechanism, a plunger having a forwardly extending plunger head insertable into the body through the second open end, and a needle extending forwardly of the first open end, wherein:

the body further comprises a nose adjacent to the first open end, a substantially cylindrical barrel adjacent to the second open end, and a transition zone connecting the barrel and nose;

the needle retraction mechanism comprises an elongated needle holder, a compressed retraction spring, and a retainer member holding the retraction spring in compression prior to retraction;

the elongated needle holder further comprises a needle holding portion secured in fixed relation to the needle and a head opposite the needle holding portion, the needle holding portion extending forwardly through the first open end; a fluid path extending longitudinally through the needle holder in fluid communication with the needle and with a variable fluid chamber inside the body between the needle holder and the plunger[[;]];

wherein the needle retraction mechanism is grounded inside the nose by a barrier limiting forward motion of the elongated needle holder inside a front portion of the nose prior to a release of the needle holding portion during retraction;

the compressed retraction spring is positioned prior to retraction in an annulus disposed between the needle holder and the inside wall of the hollow body;

the plunger head comprises a seal mounted in fixed axial relation to the plunger, the seal slidably engaging the inside wall of the body;

the plunger head advances beyond a portion of the needle holder following injection to release the compressed retraction spring during retraction;

the plunger comprises a retraction cavity into which part of the retraction mechanism is received during retraction so that the needle no longer extends forwardly of the first open end; and

the plunger comprises an end cap having an outer periphery, the outer periphery being disposed in close proximity to the second open end of the body during retraction to prevent reuse of the syringe.

82. (Previously presented): The syringe of claim 81 wherein the inside diameter of the barrel is larger than the inside diameter of the nose, and the inside diameter of the transition zone tapers inwardly between the barrel and the nose.

83. (Currently amended): The syringe of claim 81 wherein the barrel comprises at least one radially extending ~~finger grip~~ member providing finger grips for the syringe

body, and a collar comprising an open back end, the collar extending rearwardly behind the at least one ~~finger grip~~ radially extending member and longitudinally separating the at least one radially extending member from the open back end, and wherein the end cap has an outer periphery that fits closely inside the collar when the plunger is depressed during retraction.

84. (Previously presented): The syringe of claim 81 wherein the retainer member is positioned at the most constricted portion of the transition zone prior to retraction.

85. (Currently amended): The syringe of claim 81 wherein the retainer member is coupled to the needle holder head with a holding force which exceeds a retraction force applied to the needle holder head by the compressed retraction spring.

86. (Previously presented): The syringe of claim 81 wherein the needle is inserted into the needle holder through a portion of the needle holder extending forwardly of the body and attached to the needle holder.

87. (Canceled)

88. (Previously presented): The syringe of claim 81 comprising a one-piece body.

89. (Currently amended): The syringe of claim 81 wherein the inside wall of the body forwardly of the transition zone cooperates with the needle holder as a spring guide during compression of the retraction spring.

90. (Previously presented): The syringe of claim 81 wherein the retainer member has an outside mating surface making a seal with the inside wall.

91. (Previously presented): The syringe of claim 81 wherein at least a portion of the retraction mechanism is received into the retraction cavity during retraction.

92. (Previously presented): The syringe of claim 81 wherein the retainer member acts as a fluid seal for the variable fluid chamber prior to retraction.

93. (Previously presented) The syringe of claim 83 wherein the outer periphery of the plunger end cap is lodged in the barrel collar by pressing the plunger to cause retraction, thereby preventing subsequent withdrawal of the plunger from the barrel.

94. (Previously presented): The syringe of claim 81 wherein the plunger comprises a tip that extends forwardly of the plunger seal to initiate retraction.

95. (Canceled)

96. (Currently amended): A syringe assembly having a hollow body with an inside wall, a retractable needle, a needle retraction assembly seated inside the body and a plunger slidably engaging a portion of the inside wall,

the retraction assembly comprising a compressible retraction spring, a needle holder and a retainer member continuously surrounding the needle holder to hold the retraction spring in compression prior to retraction, the inside wall and needle holder cooperating as a spring guide during compression of the retraction spring,

the plunger comprising a handle with a longitudinally extending retraction cavity having a first inside diameter and a forwardly extending tip having a second inside diameter less than the first inside diameter, the tip defining an opening through which the needle holder is receivable into the retraction cavity during retraction; a seal disposed in fixed longitudinal relation to the plunger handle and in sliding engagement with the inside wall of the body,

the body further comprising a rigid stop surface that is contacted directly by the plunger seal and stops forward movement of the plunger inside the body following release of the retractable needle.

Claims 97 – 101 (Canceled)

102. (Currently amended): The syringe assembly of claim 29 wherein the body has an inside diameter immediately forward of the at least one ~~finger grip~~ radially extending member, the collar has a different inside diameter, and the inside diameter of the body immediately forward of the at least one ~~finger grip~~ radially extending member is less than the inside diameter of the collar.

103. (Currently amended): The syringe assembly of claim 37 wherein the body has an inside diameter immediately forward of the at least one ~~finger grip~~ radially extending member, the collar has a different inside diameter, and the inside diameter of the body immediately forward of the at least one ~~finger grip~~ radially extending member is less than the inside diameter of the collar.

104. (Currently amended): The syringe assembly of claim 45 wherein the body has an inside diameter immediately forward of the at least one ~~finger grip~~ radially extending member, the collar has a different inside diameter, and the inside diameter of the body immediately forward of the at least one ~~finger grip~~ radially extending member is less than the inside diameter of the collar.

105. (Previously presented): The syringe assembly of claim 54 wherein the needle holding portion of the needle holder also extends forwardly of the body.

106. (Previously presented): The syringe assembly of claim 54 wherein the body has a rigid stop surface that abuts directly against the plunger seal and stops forward movement of the plunger following release of the retractable needle.

107. (Previously presented): The syringe of claim 58 wherein the plunger is vented.

108. (Previously presented): The syringe of claim 107 wherein the retraction cavity of the plunger is vented.

109. (Previously presented): The syringe of claim 81 wherein the needle retraction mechanism is insertable into the body through the second open end.

110. (Currently amended):A syringe assembly having a retractable needle and designed for one-time use, comprising:

a hollow syringe body having a barrel with a front end portion containing a needle and a needle retraction mechanism, and with a back end portion further comprising at least one radially extending ~~finger grip~~ member providing finger grips for the syringe body and a substantially cylindrical collar comprising an open back end, the collar extending rearwardly behind the at least one ~~finger grip~~ radially extending member and longitudinally separating the at least one radially extending member from the open back end; and

a plunger having a front end portion insertable into the barrel through the collar and slidably engageable with the barrel forwardly of the at least one ~~finger grip~~ radially extending member, the plunger further comprising a retraction cavity adapted to receive a portion of the needle retraction mechanism following retraction of the needle.

111. (Previously presented): The syringe assembly of claim 110, the plunger further comprising an end cap that is disposed in close proximity to the collar following retraction.

112. (Previously presented): The syringe assembly of claim 110 wherein the retraction cavity is vented.

113. (Currently amended):A syringe assembly having a retractable needle and designed for one-time use, comprising:

a hollow syringe body having a barrel further comprising a front end portion supporting a needle retraction mechanism comprising a needle holder and a spring, the

front end portion having a small diameter open end disposed forwardly of any larger diameter section of the barrel, wherein any forward movement of the needle holder relative to the barrel is limited by an annular shoulder disposed adjacent to and defining the small diameter open end at a narrowest part of the barrel.

114. (Previously presented): The syringe assembly of claim 113 wherein the needle holder abuts the annular shoulder.

115. (Previously presented): The syringe assembly of claim 114 wherein a portion of the needle holder extends forwardly of any portion of the barrel.

116. (Currently amended): The syringe assembly of claim 113, the hollow syringe body further comprising a back end portion having at least one radially extending ~~finger grip~~ radially extending member providing finger grips for the syringe body and a collar comprising an open back end, the collar extending rearwardly of the at least one ~~finger grip~~ radially extending member and longitudinally separating the at least one radially extending member from the open back end; and

a plunger having a front end portion insertable into the barrel and slidably engageable with the inside diameter of the barrel in front of the at least one ~~finger grip~~ radially extending member, the plunger further comprising a retraction cavity adapted to receive a portion of the needle retraction mechanism following retraction of the needle and a plunger end cap disposed rearwardly of the retraction cavity, the plunger end cap being receivable into close proximity with the collar following retraction.

117. (Currently amended): A syringe comprising a hollow body, a retraction mechanism comprising a retractable needle, and a plunger insertable into the body, the syringe having a capability for injection and retraction,

the body further comprising at least one radially extending ~~finger grip~~ radially extending member providing finger grips for the syringe body and a collar comprising an open back end, the collar extending rearwardly behind the at least one ~~finger grip~~ radially extending member[[,]] and longitudinally separating the at least one radially

extending member from the ~~collar having an~~ open back end,

the body, retraction mechanism and plunger cooperating to produce two plunger stop positions that are identifiable by a user,

a first plunger stop position corresponding to completion of an injection, which is followed by the initiation of retraction if the plunger is advanced beyond the first plunger stop position by the user, and

a second plunger stop position corresponding to the completion of retraction.

118. (Currently amended):The syringe of claim 117 wherein the at least one ~~finger grip~~ radially extending member comprises two ~~finger grip~~ radially extending members disposed on substantially opposite sides of the body.

119. (Previously presented): The syringe of claim 117 wherein the plunger has an end cap with an outer periphery, and wherein the outer periphery of the end cap is in close proximity to the open back end of the collar when the plunger is in the second plunger stop position.

120. (Previously presented): The syringe of claim 119 wherein the plunger end cap is lodged inside the collar when the plunger is in the second plunger stop position.

121. (Previously presented): The syringe of claim 117 wherein the plunger vented.